Test Report

Applicant:	Guangdong East Power Co., Ltd.
Product:	Online High Frequency UPS
Trademark:	N/A
Model No:	EA66400, EA6620, EA6640, EA6660, EA6680, EA66100, EA66120, EA66140, EA66160, EA66180, EA66200, EA66220, EA66240, EA66260, EA66280, EA66300, EA66320, EA66340, EA66360, EA66380.
Prepared by:	Most Technology Service Co., Limited

The safety testing has been performed on the submitted samples and found in compliance with the council LVD directive 2006/95/EC.

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Test Report
EN 62040-1
Uninterruptible power systems (UPS) – Part 1:General and safety requirements for UPS

Report	
Reference No……..:	MTS/GEG/T13050257
Tested by (Name +signature) ……:	Grace Gong
Approved by (Name +signature) ……..:	Yvette Zhou
Date of issue……:	May 30, 2013
Testing laboratory	
Name ……..……..:	Most Technology Service Co., Limited
Address ……..……..:	No.5, 2nd Langshan Road, North District, Hi-Tech Industrial park, Nanshan, Shenzhen, Guangdong, China
Testing location .....:	Same as above
Applicant	
Name ……..……..:	GUANGDONG EAST POWER CO., LTD.
Address …….. :	NO.6 NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI &TECH INDUSTRY PARK, DONGGUAN, P.R. CHINA
Test specification	
Standard ……...:	EN 62040-1: 2008
Procedure deviation ……...:	N/A
Non-standard test method ……:	N/A
Test item	
Description ……..:	Online High Frequency UPS
Trademark …….. :	N/A
Model/type reference …….. :	EA66400
Rating …….. :	Input: AC 380V, 50Hz, 545A Output: AC 380V, 50Hz, 606A, 400KVA,/320KW Manufacture Battery: DC±240V
Manufacturer …….. :	GUANGDONG EAST POWER CO., LTD.
Address …….. :	NO.6 NORTHERN INDUSTRY ROAD, SONGSHAN LAKE SCI &TECH INDUSTRY PARK, DONGGUAN, P.R. CHINA

Test item particulars

Operation condition ……..: Continuous

Tested IT power system ……..…: N/A

IT testing, phase-phase voltage (V) ……...: N/A

Class of equipment ……..…: Class I

Mass of equipment (kg) .....: Mention in user manual

Mains supply tolerance (%)……..…: +6%, -10%

Protection against ingress of water ……: IP20

Possible test case verdicts:

– test case does not apply to the test object: N/A

– test object does meet the requirement: P (Pass)

– test object does not meet the requirement: F (Fail)

General remarks

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see appended table)" refers to a table appended to the report.

“(see remark #)” refers to a remark appended to the report.

“(see Annex #) refers to an annex appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

General Product information:

All models are with same principle, constructional and insulation, just different of rating power, etc.

The test model EA66400 is the biggest power of all models.

Summary of Testing and Conclusions:

The Online High Frequency UPS was tested and complied with the requirements of EN 62040-1:2008.

Copy of marking plate:

Online High Frequency UPS
Model: EA66400
Input: AC 380V, 50Hz, 545A, 3ϕ
Output: AC 380V, 50Hz, 606A, 400KVA/320KW
Manufacture Battery: DC±240V

Date: March, 2013

Guangdong East Power Co., ltd.
MADE IN CHINA

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
4	GENERAL CONDITIONS FOR TESTS		P
4.5	Components		P
	Comply either with the requirements of this standard or with the safety aspects of the relevant IEC component standard	All components comply with the requirements of the standard or with the safety aspects of the relevant IEC component standards See table 4.5 List of critical components	P
1.5.2/RD	Evaluation and testing of components	Components, Which are certified to IEC and/or national standards, are applied correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3/RD	Thermal controls	Thermal controls used are suitable for their intended application and particularly Annex K.	P
1.5.4/RD	Transformers	Transformers used are suitable for their intended application and comply with the relevant requirements of the standard and particularly Annex C	P
1.5.5/RD	Interconnecting cables	For external battery cabinet only	P
1.5.6/RD	Capacitors in primary circuits:	Between lines: X2 capacitor according to IEC 60384-14:1993 with 21 days damp heat test. Between line/neutral and PE: Y2 capacitor according to IEC 60384-14:1993.	P
1.5.7/RD	Double insulation or reinforced insulation bridged by components	See below.	P
1.5.7.1/RD	General	See below.	P
1.5.7.2/RD	Bridging capacitors	No bridging capacitors provided.	N/A
1.5.7.3/RD	Bridging resistors	No such resistor	N/A
1.5.7.4/RD	Accessible parts	Backfeed protection in compliance with requirements of limited current circuits. Further details see sub clause 2.4.	P
1.5.8/RD	Components in equipment for IT power systems	Not applied for IT power systems.	N/A
4.6	Power interface		P
1.6.1/RD	AC power distribution systems	TN power system.	P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
1.6.2/RD	Input current	See table 4.6	P
1.6.4/RD	Neutral conductor	Basic insulation for rated voltage between earthed parts and line and neutral conductors. O/p neutral is not isolated from the i/p neutral.	P
4.7	Marking and instructions		P
4.7.1	General		P
4.7.2	Power rating	All required markings are affixed on labels located on the front enclosure of UPS	P
	Input rated voltage/range (V) ..... :	See page 4	P
	Input rated current/range (A)..... :	See page 4	P
	Input symbol for nature of supply (d.c.) ..... :	Not designed for "d.c. only". Therefore, no such marking required.	N/A
	Input rated frequency/range (Hz) ..... :	See page 4	P
	Output rated voltage/range (V) ..... :	See page 4	P
	Output rated current/range (A) ..... :	See page 4	P
	Number of output phases (1ϕ - 3ϕ) with/without neutral :	UPS: 3ϕ, with neutral	P
	Output rated active power (W) ..... :	See page 4	P
	Output rated apparent power (VA) ..... :	See page 4	P
	Output symbol for nature of supply (d.c.) ..... :	No d.c. output. Therefore, no such marking required.	N/A
	Rated frequency or rated frequency range (Hz)……:	See page 4	P
	Max. ambient operating temperature range (°C)…….. :	0℃-40℃	P
	Manufacturer's name or trademark or identification mark ..... :	Guangdong East Power Co., ltd.	P
	Type/model or type reference ..... :	See page 4	P
	Symbol for Class II equipment only ..... :	Class I equipment	N/A
	Other symbols ..... :	Additional symbols or markings do not give rise to misunderstanding.	P
	Certification marks ..... :	CE	P
	Instructions for units with automatic bypass/maintenance bypass, additional input a.c. supply, or external batteries, having text "See installation instructions before connecting to the supply" ..... :	See user manual	P
4.7.3	Safety instructions	See below.	P
4.7.3.1	General	See below.	P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Safety instructions available as required to avoid introduction of hazards when operating, installing, maintaining, transporting or storing the UPS.	User manual inform adequate information to users and there are such words in user manuals	P
4.7.3.2	Installation		P
	Guidance on the level of competence necessary for installation for operator and service person .....:	User manual inform adequate information to users and there are such words in user manuals	P
	Installation instructions should include reference to national wiring rules.		P
4.7.3.3	Operation		P
	Guidance on the level of competence necessary to operate the equipment.	User manual inform adequate information to users and there are such words in user manuals	P
4.7.3.4	Maintenance		P
	Safety instructions to be used during maintenance of the UPS are normally made available only to service persons.		P
4.7.3.5	Distribution related backfeed		P
	For the purpose of warning the electrical service person against backfeed situations not caused by the UPS but that may arise when a particular load fault is present while the UPS operates in stored energy mode or while unbalanced loads are supplied through a particular power distribution system, the installation instructions for permanently connected UPS shall require the fitting of a warning label		P
	Warning label with text "Before working on this circuit, -Isolate Uninterruptible Power System (UPS) -Then check for Hazardous Voltage between all terminals including the protective earth. Risk of Voltage Backfeed		P
4.7.4	Main voltage adjustment .....:	No mains voltage adjustment device	N/A
1.7.4/RD	Supply voltage adjustment .....:	No adjustment.	N/A
	Methods and means of adjustment; reference to installation instructions .....:		N/A
4.7.5 1.7.5/RD	Power outlets .....:	The maximum apparent and active power of the standard outlet is indicated on the rating plate.	P
4.7.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	There is a marking located adjacent to each fuse to indicate the specification of the fuse	P
4.7.7 1.7.7/RD	Wiring terminals	See below.	P
1.7.7.1/RD	Protective earthing and bonding terminals .....:	The protective earthing wiring terminal is indicated by the symbol (IEC60417)	P
1.7.7.2/RD	Terminal for a.c. mains supply conductors .....:	Letter 'N' used	P
1.7.7.3/RD	Terminals for d.c. mains supply conductors ……..:		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
4.7.8	Battery terminals .....:	Internal batteries used	N/A
4.7.9 1.7.8/RD	Controls and indicators	See below.	P
1.7.8.1/RD	Identification, location and marking .....:	On battery bodys	P
1.7.8.2/RD	Colours ..... :	Colours are acceptable due to only used for information (no safety involved even if disregarded).	P
1.7.8.3/RD	Symbols according to IEC 60417..... :		N/A
1.7.8.4/RD	Markings using figures ..... :	Not used.	N/A
4.7.10 1.7.9/RD	Isolation of multiple power sources ..... :	Only one external supply of hazardous voltage or energy	N/A
4.7.11	IT power systems	Not applied for IT power systems.	N/A
1.7.10/RD	IT power distribution systems		N/A
4.7.12	Protection in building installations	Permanerce connected three-phase UPS, have the protectin in buiding installations and other protection.	P
4.7.13 5.1/RD	High leakage current (mA) ..... :	Leakage current of the equipment does not exceed 3.5 mA.	N/A
4.7.14 1.7.11/RD	Thermostats and other regulating devices	No device is intended to be adjusted during in installation or normal operation mode	N/A
4.7.15 1.7.12/RD	Language(s) ..... :	English Language	P
4.7.16 1.7.11/RD	Durability of markings	The labels were subjected to the permanence of marking test. The labels were rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. After this test there was no damage to the labels. The marking on the labels did not fade. There was neither curling nor lifting of the label edges.	P
4.7.17 1.7.12/RD	Removable parts	No removable part in normal operation mode	N/A
4.7.18	Replaceable batteries	Replaceable by server person. See user manual	P
1.7.13/RD	- if the battery is placed in an OPERATOR ACCESS AREA, there shall be a marking close to the battery or a statement in both the operating and the servicing instructions;		N/A
	- if the battery is placed elsewhere in the equipment, there shall be a marking close to the battery or a statement in the servicing instructions.		P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
4.7.19 1.7.2.5/RD	Operator access with a tool..... :	There is no operator access with a tool in normal operation mode	N/A
4.7.20	Battery	There is a battery warning label in the battery compartment to show the following information --- battery type --- nominal voltage of total battery --- nominal capacity of total battery --- warning label denoting an energy or electrical shock and chemical hazard and reference See label in Annex Photos	P
	Clearly legible information ..... :	Warning label containing below described information placed on enclosure of UPS and battery compartment. Information clearly legible.	P
	Battery type .....:	Lead acid, type as "12Vdc 7Ah"	P
	Nominal voltage of total battery (V) ……..... :	DC±240V	P
	Nominal capacity of total battery (optional) ……..... :	7Ah	P
	Warning label .....:		P
	Instructions .....:		P
4.7.21	Installation instructions	No special attention is needed	N/A

5	FUNDAMENTAL DESIGN REQUIREMENTS		P
5.1	Protection against electric shock and energy hazards		P
5.1.1	Protection for UPS intended to be used in operator access areas	See below.	P
2.1.1.2/RD	Battery compartments..... :		P
2.1.1.4/RD	Access to hazardous voltage circuit wiring	No any hazardous voltage circuit wiring can be accessed by operator.	P
2.1.1.5/RD	Energy hazards ..... :	There is no energy hazard in operation access areas	P
2.1.1.6/RD	Manual controls	No conductive controls or handles or alike provided.	N/A
	Permitted to have access to: - bare parts of SELV circuits - bare parts of limited current circuits - TNV circuits under specified conditions	Operator access to earthing metal enclosure only. TNV circuits can't accessed by operation, test with probe	P
5.1.2	Protection for UPS intended to be used in service access areas		N/A
5.1.3	Protection for UPS intended to be used in restricted access areas		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Working voltage (Vpeak or Vrms); minimum distance (mm) through insulation		-
5.1.4	Backfeed protection	See appended table 8.2.	-
	Description of the construction ..... :	Backfeed protection provided by the mains relay.	P
5.1.5	Emergency switching device		P
5.2	Requirements for auxiliary circuits		P
5.2.1	Safety extra low voltage circuits – SELV		P
2.2.1/RD	General requirements		P
2.2.2/RD	Voltages under normal conditions		P
2.2.3/RD	Voltages under fault conditions		P
2.2.4/RD	Connection of SELV circuits to other circuits	Use isolate transformer and adequate creepage distance and clearance to provide reinforced insulation between RS232 circuit and hazardous voltage circuits	P
5.2.2	Telephone network voltage circuits – TNV		N/A
5.2.3	Limited current circuits		N/A
2.4.1/RD	General requirements See below.		N/A
2.4.2/RD	Limit values See appended table 5.3.		N/A
	Frequency (Hz) .....:		-
	Measured current (mA) .....:		-
	Measured voltage (V).....:		-
	Measured capacitance (μF) .....:		-
2.4.3/RD	Connection of limited current circuits to other circuits		N/A
5.2.4	External signalling circuits		N/A
3.5/RD	Interconnection of equipment		N/A
3.5.1/RD	General requirements		N/A
3.5.2/RD	Types of interconnection circuits		N/A
3.5.3/RD	ELV circuits as interconnection circuits		N/A
3.5.4/RD	Data ports for additional equipment		N/A
5.2.5 2.5/RD	Limited power source	For RS-232 USB, RS485 port	P
	a) Inherently limited output		N/A
	b) Impedance limited output		P
	c) Regulating network limited output under normal operating and single fault condition		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)		--
	Current rating of overcurrent protective device (A)		--
5.3	Protective earthing and bonding		P
5.3.1	General	See below.	P
2.6/RD	Provisions for earthing and bonding	See below.	P
5.3.1 2.6.1/RD	Protective earthing	UPS are class I equipments, connection of relevant conductive parts to the PE terminal via green/yellow insulated wires.	P
2.6.2/RD	Functional earthing	All eartheing is separated from parts at hazardous voltages	P
2.6.3/RD	Protective earthing and protective bonding conductors		P
2.6.3.1/RD	General		P
2.6.3.2/RD	Size of protective earthing conductors	Size of protective earthing conductors comply with the requirements in table 3B/RD	P
	Rated current (A), cross-sectional area (mm^2), AWG		-
2.6.3.3/RD	Size of protective bonding conductors	Size of protective earthing conductors comply with the requirements in table 3B/RD Same as 2.6.3.1/RD	P
	Rated current (A), cross-sectional area (mm2), AWG		-
2.6.3.4/RD	Resistance (Ω) of earthing conductors and their terminations, resistance (ohm), voltage drop (V), test current (A), duration (min)	Resistance of the protective bonding conductor is less than 0.1Ω See table 5.3 2.6.3.3/RD Ground continuity Test	P
2.6.3.5/RD	Colour of insulation:	The insulation of the protective eatthing conductor in power cord supplied with equipment and the protective bonding conductor is green and yellow	P
2.6.4/RD	Terminals	See below.	P
2.6.4.1/RD	General		P
2.6.4.2/RD	Protective earthing and bonding terminals		P
	Rated current (A), type, nominal thread diameter (mm)		–
2.6.4.3/RD	Separation of the protective earthing conductor from protective bonding conductors	The earthing terminal in the appliance inlet is regarded as the main protective earthing terminal Separate wiring terminals are provided to protective earthing conductor and protective bonding conductor	P
2.6.5/RD	Integrity of protective earthing	See below.	P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
2.6.5.1/RD	Interconnection of equipment	This unit has it's own earthing connection. PE terminals of outlets reliably connected to PE terminal of unit	P
2.6.5.2/RD	Components in protective earthing conductors and protective bonding conductors		P
2.6.5.3/RD	Disconnection of protective earth		N/A
2.6.5.4/RD	Parts that can be removed by an operator		N/A
2.6.5.5/RD	Parts removed during servicing	The relevant potential hazard is removed at the same time when protective earthing connection is disconnected for servicing	P
2.6.5.6/RD	Corrosion resistance	All safety earthing connections in compliance with Annex J.	P
2.6.5.7/RD	Screws for protective bonding	Self-tapping screws are used to provided protective bonding connection and is threaded into more than twice the pitch of the screw thread	P
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system	Protective earthing does not rely on a TNV circuit	N/A
5.3.2	Protective earthing		P
5.3.3	Protective bonding		P
5.4	AC and d.c. power isolation		P
5.4.1	General		P
3.4/RD	Disconnection from the mains supply		P
3.4.1/RD	General requirement	See below.	P
3.4.2/RD	Disconnect devices	Permanently connected equipment	P
3.4.3/RD	Permanently connected equipment		P
3.4.4/RD	Parts which remain energized		N/A
3.4.5/RD	Switches in flexible cords	No switchs in the flexible cords	N/A
3.4.6/RD	Number of poles-single-phase and d.c. equipment		N/A
3.4.7/RD	Number of poles- three-phase equipment		P
3.4.8/RD	Switches as disconnect devices		P
3.4.9/RD	Plugs as disconnect devices	Permanence connected equipment, no plugs used	N/A
3.4.10/RD	Interconnected equipment		N/A
3.4.11/RD	Multiple power sources	UPS under test receives power from an AC 380V power source	N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
5.4.2	Disconnect devices	Ungrounded battery, the internal battery DC supply of the UPS can be disconnected by the quick connectors of the battery	P
5.5	Overcurrent and earth fault protection		P
5.5.1	General		P
2.7.3/RD	Short-circuit backup protection	Building installation is considered as providing. shortcircuit backup protection.	P
2.7.4/RD	Number and location of protective devices ..... :	Over current protection by the Input breaker in equipment Protection devices considered to provide sufficient protection against earth faults.	P
2.7.5/RD	Protection by several devices		P
2.7.6/RD	Warning to service personnel ..... :	See user manual	P
5.5.2	Basic requirements	Equipment relies on circuit breaker in the equipment in regard to L to N short-circuit. Over current protection is provided by the built-in circuit breaker.	P
5.5.3	Battery circuit protection	See below	P
5.5.3.1	Overcurrent and earth fault protection		P
5.5.3.2	Location of protective device	Battery supplies are protected by fuses located adjacent to the batteries before any components which may fail short-circuited, such as capacitors, semi-conductor	P
5.5.3.3	Rating of protective device	See table4.3.	P
5.3.1/RD	Protection against overload and abnormal operation	No hazards	P
5.6	Protection of personnel – Safety interlocks		N/A
5.6.1	Operator protection		N/A
2.8/RD	Safety interlocks		N/A
2.8.1/RD	General principles		N/A
2.8.2/RD	Protection requirements		N/A
2.8.3/RD	Inadvertent reactivation		N/A
2.8.4/RD	Fail-safe operation		N/A
2.8.5/RD	Moving parts		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
2.8.6/RD	Overriding		N/A
2.8.7/RD	Switches and relays		N/A
2.8.7.1/RD	Contact gaps (mm) ..... :		N/A
2.8.8/RD	Mechanical actuators		N/A
2.8.7.2/RD	Overload test		N/A
2.8.7.3/RD	Endurance test		N/A
2.8.7.4/RD	Electric strength test		N/A
5.6.2	Service person protection	There is no service person access areas while EUT is energized.	N/A
5.6.2.1	Introduction		N/A
5.6.2.2	Covers		N/A
5.6.2.3	Location and guarding of parts		N/A
5.6.2.4	Parts on doors		N/A
5.6.2.5	Component access		N/A
2.8.3/RD	Inadvertent reactivation		N/A
5.6.2.6	Moving parts		N/A
5.6.2.7	Capacitor banks		N/A
5.6.2.8	Internal batteries.		N/A
5.7 2.10/RD	Clearances, creepage distances and distances through insulation		P
2.10.1/RD	General	Adopt the condition-Pollution Degree 2	P
2.10.2/RD	Determination of working voltage	Unit was connected to AC 380V(maximum) TN power system. See appended table 8.2	P
2.10.3/RD	Clearances	See below, Annex G was not considered.	P
2.10.3.1/RD	General	Annex F/RD and minimum clearances considered.	P
2.10.3.2/RD	Clearances in primary circuits	Clearance in primary circuits meet the requirement	P
2.10.3.3/RD	Clearances in secondary circuits	Clearance in secondary circuits meet the requirement	P
2.10.3.4/RD	Measurement of transient voltage levels		N/A
2.10.4/RD	Creepage distances	Cree-page distance meets the requirement	P
	CTI tests..... :	CTI rating for all materials of min. 100.	-

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
2.10.5/RD	Solid insulation	See below.	P
2.10.5.1/RD	Minimum distance through insulation	See appended table.	P
2.10.5.2/RD	Thin sheet material	Transformer insulation sheet and mylar sheet used	P
	Number of layers (pcs)..... :	Three for transformer insulation, and one layer for my lar sheet.	-
	Electric strength test	3000V	-
2.10.5.3/RD	Printed boards		P
	Distance through insulation		P
	Electric strength test for thin sheet insulating material		-
	Number of layers (pcs)..... :		-
2.10.5.4/RD	Wound components		N/A
	Number of layers (pcs)..... :		N/A
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		N/A
2.10.6/RD	Coated printed boards		N/A
2.10.6.1/RD	General		N/A
2.10.6.2/RD	Sample preparation and preliminary inspection		N/A
2.10.6.3/RD	Thermal cycling		N/A
2.10.6.4/RD	Thermal ageing (°C)..... :		N/A
2.10.6.5/RD	Electric strength test		-
2.10.6.6/RD	Abrasion resistance test		N/A
	Electric strength test		-
2.10.7/RD	Enclosed and sealed parts..... :		N/A
	Temperature $T_1=T_2+T_{ma}-T_{amb}+10K$ (°C) ..... :		N/A
2.10.8/RD	Spacings filled by insulating compound ..... :	Certified sources of Photo-coupler used. No other components applied for.	P
	Electric strength test	Electric strength test was performed during the component approval.	-
2.10.9/RD	Component external terminations		P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
2.10.10/RD	Insulation with varying dimensions	No reduction of distances considered.	N/A
6	WIRING, CONNECTIONS AND SUPPLY		P
6.1	General		P
6.1.1 3.1/RD	Introduction		P
3.1.1/RD	Current rating and overcurrent protection	All wirings meet the requirement	P
3.1.2/RD	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks, which could damage the insulation and cause hazard.	P
3.1.3/RD	Securing of internal wiring	Internal wirings are routed, supported, clamped, secured in place	P
3.1.4/RD	Insulation of conductors		P
3.1.5/RD	Beads and ceramic insulators	Not used.	N/A
3.1.6/RD	Screws for electrical contact pressure	All screws for electrical contact pressure are threaded into more than two complete threads	P
3.1.7/RD	Insulating materials in electrical connections	There is not non-metallic material to be used in electrical connections in EUT	N/A
3.1.8/RD	Self-tapping and spaced thread screws	No self- tapping or spaced thread screws used for connection of current-carrying parts.	N/A
	10 N pull test Test performed and passed.		P
3.1.9/RD	Termination of conductors	Use soldered, welded and similar terminations for the connection of conductors	P
3.1.10/RD	Sleeving on wiring	Heat shrinkable tube reliable fix on the wiring	P
6.1.2	Dimensions and ratings of busbars and insulated conductors		P
6.2	Connection to power		P
6.2.1	General provisions for connection to power		P
3.2.2/RD	Multiple supply connections	Single supply connection	N/A
3.2.3/RD	Permanently connected equipment		P
	Number of conductors, diameter (mm) of cable and conduits .....:	See table 4.3	-
3.2.4/RD	Appliance inlets		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
3.2.5/RD	Power supply cords	See below	P
3.2.5.1/RD	AC power supply cords	See appended table	P
	Type ..... :		-
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	See table 4.3	-
3.2.5.2/RD	DC power supply cords		N/A
3.2.6/RD	Cord anchorages and strain relief		P
3.2.7/RD	Protection against mechanical damage	No parts under this unit likely to damage the power supply cord. Enclosure without sharp edges.	P
3.2.8/RD	Cord guards		P
	D (mm); test mass (g) ..... :		-
	Radius of curvature of cord (mm) ..... :		-
6.2.2	Means of connection ..... :	Wire terminals	P
	More than one supply connection ..... :	Only one supply connection provided.	N/A
6.3	Wiring terminals for external power conductors		P
3.3.1/RD	Wiring terminals	permanently connected equipments provided with terminals in which connection is made by means of screws and nuts	P
3.3.2/RD	Connection of non-detachable power supply cords		P
3.3.3/RD	Screw terminals		P
3.3.4/RD	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, crosssectional area (mm^2)..... :		-
3.3.5/RD	Wiring terminal sizes		P
	Rated current (A), type and nominal thread diameter (mm) ..... :		-
3.3.6/RD	Wiring terminals design		P
3.3.7/RD	Grouping of wiring terminals		P
3.3.8/RD	Stranded wire		N/A
7	PHYSICAL REQUIREMENTS		P
7.1	Enclosure	The frame or chassis of EUT is not use to carry current during intended operation	P
7.2	Stability	See below.	P
4.1/RD	Angle of 10°	The unit does not overbalance • Tilted to an angle of 10°	P
	Test: force (N) ..... :	232*20%=46.4N	P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
7.3	Mechanical strength		P
4.2.1/RD	General	Tests performed and passed. Results see below. After tests, unit complied with the requirements of sub-clauses 2.1.1/RD, 2.6.1/RD and 2.10/RD.	P
4.2.2/RD	Steady force test, 10 N	10 N applied to all components other than enclosure.	P
4.2.3/RD	Steady force test, 30 N	30N, 5S to door	P
4.2.4/RD	Steady force test, 250 N	250 N applied to outer enclosure.	P
4.2.5/RD	Impact test	See Below	P
	Fall test	No hazard as result from steel ball fall test.	P
	Swing test	No hazard as result from steel ball swing test.	P
4.2.6/RD	Drop test	Not required for this equipment.	N/A
4.2.7/RD	Stress relief test Test	performed at 70°C no distortion found on front panel.	P
4.2.8/RD	Cathode ray tubes	No CRT in the unit.	N/A
	Picture tube separately certified..... :		N/A
4.2.9/RD	High pressure lamps No high pressure lamp provided.		N/A
4.2.10/RD	Wall or ceiling mounted equipment; force (N) . :		N/A
7.4	Construction details		P
7.4.1	Introduction		P
4.3.1/RD	Edges and corners	All edges and corners are rounded and smoothed	P
4.3.2/RD	Handles and manual controls; force (N) ..... :	No handles or manual controls provided. No axial pull applied to push-buttons.	N/A
4.3.3/RD	Adjustable controls	There is not such adjustable control device in EUT	N/A
4.3.4/RD	Securing of parts	There is not such part of securing in EUT	P
4.3.5/RD	Connection of plugs and sockets		N/A
4.3.7/RD	Heating elements in earthed equipment	No heating elements provided.	N/A
4.3.11/RD	Containers for liquids or gases	No container for liquids or gases provided.	N/A
4.4/RD	Protection against hazardous moving part		N/A
4.4.1/RD	General	No such moving part used.	N/A
4.4.2/RD	Protection in operator access areas		N/A
4.4.3/RD	Protection in restricted access locations		N/A
4.4.4/RD	Protection in service access areas		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
4.5/RD	Thermal requirements		P
4.5.1/RD	General	See table 7.7 for details.	P
4.5.2/RD	Temperature tests		P
	Normal load condition per Annex L		--
4.5.3/RD	Temperature limits for materials	See Table 7.7 for details.	P
4.5.4/RD	Touch temperature limits	See Table 7.7 for details.	P
4.5.5/RD	Resistance to normal heat	(see appended table 7.7)	P
7.4.2	Openings	EUT are equipped with DC fan to vented. No arcing component is adjacent to batteries	P
7.4.3	Gas concentration		N/A
7.4.4	Equipment movement	No castors provided.	N/A
7.5 4.7/RD	Resistance to fire		P
4.7.1/RD	Reducing the risk of ignition and spread of flame	See below.	P
	Method 1, selection and application of components wiring and materials	Use of materials with the required flammability classes.	P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2/RD	Conditions for a fire enclosure	See below.	P
4.7.2.1/RD	Parts requiring a fire enclosure	With having the following components: Components in primary circuits Insulated wiring The fire enclosure is required.	P
4.7.2.2/RD	Parts not requiring a fire enclosure		N/A
4.7.3/RD	Materials		P
4.7.3.1/RD	General	PCB rated accordingly. For details see table 4.3.	P
4.7.3.2/RD	Materials for fire enclosures	Metal enclosure with thermoplastic front panel. For details see table 4.3.	P
4.7.3.3/RD	Materials for components and other parts outside fire enclosures	See subclause 4.7.2/RD.	N/A
4.7.3.4/RD	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2, HF-2 or better. Batteries have a flammability class of HB (or better).	P
4.7.3.5/RD	Materials for air filter assemblies	No air filters provided.	N/A
4.7.3.6/RD	Materials used in high-voltage components	No high voltage components provided.	N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
7.6	Battery location		P
7.6.1	Battery location and installation	Separate battery rooms	P
7.6.2	Accessibility and maintainability		P
7.6.3	Distance	The batteries are fixed in place and the temperature of mounting parts meet requirement of less than 45 degree temperature rise	P
7.6.4	Case insulation		P
5.2/RD	Electric strength		P
5.2.1/RD	General		P
5.2.2/RD	Test procedure		P
7.6.5	Wiring	Contact, connections and wiring are protected against effects of ambient tem., moisture, gas, vapour and mechanical stress.	P
7.6.6	Electrolyte spillage	EUT are equipped with VRLA type batteries.	N/A
7.6.7	Ventilation	EUT are equipped with DC fan to vented. No arcing component is adjacent to batteries	P
7.6.8	Charging voltages	No hazards	P
7.7	Temperature rise		P
	Maximum temperatures	No excessive temperatures	P
4.5/RD	Thermal requirements		P
4.5.1/RD	General	See table 7.7 for details.	P
4.5.2/RD	Temperature tests		P
	Normal load condition per Annex L		--
4.5.3/RD	Temperature limits for materials	See Table 7.7 for details.	P
4.5.4/RD	Touch temperature limits	See Table 7.7 for details.	P
4.5.5/RD	Resistance to normal heat	See Table 7.7 for details.	P
8	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
8.1 5.1.1/RD	General provisions for earth leakage		P
	Earth leakage current	See subclause 5.1.2/RD below.	P
5.1.2/RD	Equipment under test (EUT)	Only one AC main supply	P
5.1.7/RD	Equipment with touch current exceeding 3.5 mA :	Touch current of the equipment does not exceed 3.5 mA.	P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
8.2	Electric strength		P
5.2.1/RD	General	See appended table 8.2.	P
5.2.2/RD	Test procedure	See appended table 8.2.	P
8.3	Abnormal operating and fault conditions		P
8.3.1	General		P
5.3.1/RD	Protection against overload and abnormal operation	No hazards	P
5.3.2/RD	Motors	DC fan are blocked off	P
5.3.3/RD	Transformers	See appended Annex C.	P
5.3.4/RD	Functional insulation ..... :	EUT meet the requirement	P
5.3.5/RD	Electromechanical components	No electromechanical component (except for approved relays) provided.	N/A
5.3.9/RD	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1/RD	During the tests	---No fire accurs ---EUT do not emit molten metal ---Enclosures do not deform	P
5.3.9.2/RD	After the tests	After all abnormal test ---reinforced and basic insulation does show visible signs of damage ---the clearance and creepage distance do not reduce below the value specified in 2.10/RD	P
8.3.2	Simulation of faults	No hazards	P
8.3.3	Conditions for tests	No hazards	P
9	CONNECTION TO TELECOMMUNICATION NETWORKS		P
6.1/RD	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		P
6.1.1/RD	Protection from hazardous voltages		P
6.1.2/RD	Separation of the telecommunication network from earth		P
6.1.2.1/RD	Requirements		P
	Test voltage (V) ..... :	3kV	–
	Current in the test circuit (mA) ..... :	Not exceed 10mA	-
6.1.2.2/RD	Exclusions ..... :		N/A
6.2/RD	Protection of equipment users from overvoltages on telecommunication networks		P
6.2.1/RD	Separation requirements		P

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
6.2.2/RD	Electric strength test procedure		P
6.2.2.1/RD	Impulse test		P
6.2.2.2/RD	Steady-state test		P
6.2.2.3/RD	Compliance criteria		P
6.3/RD	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A) ..... :		-
	Current limiting method..... :		-
2.1.3/RD	Protection in restricted access locations	The unit is not limited to be used in restricted access locations.	N/A
2.3/RD	TNV circuits		P
2.3.1/RD	Limits		P
	Type of TNV circuits..... :		-
2.3.2/RD	Separation from other circuits and from accessible parts		P
	Insulation employed ..... :		–
2.3.3/RD	Separation from hazardous voltages		P
	Insulation employed ..... :		–
2.3.4/RD	Connection of TNV circuits to other circuits		N/A
	Insulation employed ..... :		–
2.3.5/RD	Test for operating voltages generated externally		N/A
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system		P
2.10.3.3/RD	Clearances in secondary circuits		P
2.10.3.4/RD	Measurement of transient voltage levels		P
2.10.4/RD	Creepage distances		P
3.5/RD	Interconnection of equipment		N/A
3.5.1/RD	General requirements		N/A
3.5.2/RD	Types of interconnection circuits..... :		N/A
M/RD ANNEX M,	CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1/RD)		P
M.1/RD	Introduction		P
M.2 /RD	Method A		P
M.3/RD	Method B		N/A
M.3.1/RD	Ringing signal		P
M.3.1.1/R	Frequency (Hz) ..... :	<70Hz	–

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
D			
M.3.1.2/RD	Voltage (V) ..... :	<300V	–
M.3.1.3/RD	Cadence; time (s), voltage (V) ..... :	8s, Not exceed 56.5V	–
M.3.1.4/RD	Single fault current (mA) ..... :	Not exceed 56.5mA	–
M.3.2/RD	Tripping device and monitoring voltage ..... :		P
M.3.2.1/RD	Conditions for use of a tripping device or a monitoring voltage		P
M.3.2.2/RD	Tripping device		P
M.3.2.3/RD	Monitoring voltage (V) ..... :	Not exceed 56.5V	-
A/RD	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
A.1/RD	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18kg, and of stationary equipment (see 4.7.3.2)	Metal enclosure	N/A
A.1.1/RD	Samples ……:		-
	Wall thickness (mm) ……:		-
A.1.2/RD	Conditioning of samples; temperature (℃) ……..:		N/A
A.1.3/RD	Mounting of samples ……:		N/A
A.1.4/RD	Test flame (see IEC 60695-11-3)		N/A
	Flame A, B, C or D ……:		-
	Test procedure		N/A
	Compliance criteria		N/A
A.1.6/RD	Sample 1 burning time (s) ……..:		-
	Sample 2 burning time (s) ……..:		-
	Sample 3 burning time (s) ……..:		-
A.2/RD	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N/A
A.2.1/RD	Samples, material ……:		-
	Wall thinkness (mm)		-
A.2.2/RD	Conditioning of samples		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
A.2.3/RD	Mounting of samples		N/A
A.2.4/RD	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C ……:		-
A.2.5/RD	Test procefure		N/A
A.2.6/RD	Compliance criteria		N/A
	Sample 1 burning time (s) ……..:		-
	Sample 2 burning time (s) ……..:		-
	Sample 3 burning time (s) ……..:		-
A.2.7/RD	Alternative test acc. to IEC 60695-2-2, cl. 4 and 8		N/A
	Sample 1 burning time (s) ……..:		-
	Sample 2 burning time (s) ……..:		-
	Sample 3 burning time (s) ……..:		-
A.3/RD	Hot flaming oil test (see 4.6.2)		N/A
A.3.1/RD	Mounting of samples		N/A
A.3.2/RD	Test procedure		N/A
A.3.3/RD	Compliance criterion		N/A

B/RD	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2/RD and 5.3.2/RD)		P
B.1/RD	General requirements	d.c. fan motors in SECONDARY CIRCUITS	P
	Position ……:	Rear of the enclosure	-
	Manufacturer ……:	See table 4.3	-
	Type ……..:	See table 4.3	-
	Rated values ……:	See table 4.3	-
B.2/RD	Test conditions	The test in the equipment	P
B.3/RD	Maximum temperatures	No excessive temperatures	P
B.4/RD	Running overload test		N/A
B.5/RD	Locked-rotor overload test		N/A
	Test duration (days) ……:		-
	Electric strength test: test voltage (V) ……:		-
B.6/RD	Running overload test for d.c. motors in secondary circuits	No possible	N/A
B.6.1/RD	General		N/A
B.6.2/RD	Test procedure		N/A
B.6.3/RD	Alternative test procedure		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
B.6.4/RD	Electric strength test		N/A
B.7/RD	Locked-rotor overload test for d.c. motors in secondary circuits		P
B.7.1/RD	General		P
B.7.2/RD	Test procedure	Block until steady conditions are established	P
B.7.3/RD	Alternative test procedure; test time (h) ……:	Temp. not exceed the values specified in Table B.1. after test 2h until steady conditions are established	P
B.7.4/RD	Electric strength test	Operation voltage Not exceed 60 V d.c	N/A
B.8/RD	Test for motors with capacitors		N/A
B.9/RD	Test for three-phase motors		N/A
B.10/RD	Test for series motors		N/A
	Operating voltage (V) ……..:		-
C/RD	ANNEX C, TRANSFORMERS (see 1.5.4/RD and 5.3.3/RD)		P
	Position ……..……..:	See table 4.3	-
	Manufacturer ……..……:		-
	Type ……..……..:		-
	Rated values ……..……:		-
	Method of protection ……..……:		-
C.1/RD	Overload test	No excessive temperature	P
C.2/RD	Insulation		P
	Protection from displacement of windings ……:		N/A
	Safety isolation transformer		P
With AC 3000V after humidity treatment			
Result		-	
D/RD	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4/RD)		P
D.1/RD	Measuring instrument		P
D.2/RD	Alternative measuring instrument	Not used	N/A
E/RD	TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
	Thermocouple method used		-

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
F/RD	MEASURING OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)		P
G/RD	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
G.1/RD	General		N/A
G.1.1/RD	General		N/A
G.1.2/RD	Summary of the procedure for determining minimum clearances		N/A
G.2/RD	Determination of mains transient voltage (V) ……..:		N/A
G.2.1/RD	AC mains supply		N/A
G.2.2/RD	Earthed d.c. mains supplies		N/A
G.2.3/RD	Unearthed d.c. mains supplies		N/A
G.2.4/RD	Battery operation		N/A
G.3/RD	Determination of telecommunication network transient voltage (V) ……:		N/A
G.4/RD	Determination of required withstand voltage (V) ……..:		N/A
G.4.1/RD	Mains transients and internal repetitive peaks		N/A
G.4.2/RD	Transients from telecommunication networks		N/A
G.4.3/RD	Combination of transients		N/A
G.4.4/RD	Transients from cable distribution systems		N/A
G.5/RD	Measurement of transient levels (V) ……..:		N/A
G.6/RD	Determination of minimum clearances ……..:		N/A
H/RD	ANNEX H, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER AND FOREIGN OBJECTS (see IEC 60529)		N/A
J/RD	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6/RD)		P
	Metal used ……:	Screw: steel plated with Zn; Enclosure: mild metal Nut and washer: steel plated with Zn The max electrochemical potential is :0. 3V for metal with Zn	-
K/RD	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		N/A
K.1/RD	Marking and breaking capacity		N/A
K.2/RD	Thermostat reliability; operating voltage (V) ……:		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
K.3/RD	Thermostat endurance test; operating voltage (V) ….:		N/A
K.4/RD	Temperature limiter endurance; operating voltage (V) :		N/A
K.5/RD	Thermal cut-out reliability		N/A
K.6/RD	Stability of operation		N/A
L	ANNEX L, BACKFEED PROTECTION TEST		P
L.1	General	See L.2 below.	P
L.2	Test for pluggable equipment type A or pluggable equipment type B UPS	No pluggable equipment	N/A
L.3	Test for permanently connected UPS		P
L.4	Single-fault conditions	No hazards	P
M	ANNEX M, EXAMPLES OF REFERENCE LOAD CONDITIONS		P
M.1	General	See below.	P
M.2	Reference resistive load		N/A
M.3	Reference inductive-resistive load		N/A
M.4	Reference capacitive-resistive loads	Worst-case power factors as specified by the manufacturer maintained during the relevant tests.	P
M.5	Reference non-linear load		N/A
M.5.1	Test method		N/A
M.5.2	Connection of the non-linear reference load		N/A
N	ANNEX N, VENTILATION OF BATTERY COMPARTMENTS		P
N.1	General		P
N.2	Hydrogen concentration	See N.1 above.	P
N.3	Blocked conditions	comply with require even if the fan is blocked	P
N.4	Overcharge test	No hazards	P
U/RD	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4/RD)		N/A
U.1/RD	Wire construction	No such wires used	N/A
U.2/RD	Type tests		N/A
U.2.1/RD	Electric strength		N/A

EN 62040-1			
Clause	Requirement – Test	Result - Remark	Verdict
U.2.2/RD	Flexibility and adherence		N/A
U.2.3/RD	Heat shock		N/A
U.2.4/RD	Retention of electric strength after bending		N/A
U.3/RD	Tests during manufacture		N/A
U.3.1/RD	Routine testing		N/A
U.3.2/RD	Sampling tests		N/A
X	ANNEX X, GUIDANCE FOR DISCONNECTION OF BATTERIES DURING SHIPMENT		N/A
X.1	Applicable products	Currently this annex is only informative.	N/A
X.2	Battery disconnection		N/A
X.3	Package labelling/marking		N/A
X.4	Damage inspection		N/A
X.5	The importance of safe handling procedures		N/A
Y/RD	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see clause 4.3.13.3/RD)		N/A
Y.1/RD	Test apparatus ……:		N/A
Y.2/RD	Mounting of test samples ……:		N/A
Y.3/RD	Carbon-arc light-exposure apparatus ……:		N/A
Y.4/RD	Xenon-arc light exposure apparatus ……..:		N/A

4.3	TABLE: list of critical components and materials	P

Object/Part No.	Manufacturer /Trademark	Type/Model	Technical Data2)	Mark(s) of Conformity1)
Wire	Shenzhen Jinyangguang Wire & Cable Co., Ltd.	60227 IEC 02(RV)	4mm^2 450/750V	TUV
Alt.	Guangzhoushi Qiguang Cables & Wires Co.,Ltd	60227 IEC 02(RV)	4mm^2 450/750V	TUV
Alt.	Various	60227 IEC 02(RV)	4mm^2 450/750V	TUV
Wire	Guangzhoushi Qiguang Cables & Wires Co.,Ltd	IEC 02(RV)	95mm^2, 70mm^2 4mm^2, 35mm^2, 25mm^2 ,450/750V	TUV
Alt.	Shenzhen Jinyangguang Wire & Cable Co., Ltd.	60227 IEC 02(RV)	95mm^2, 70mm^2 4mm^2, 35mm^2, 25mm^2 ,450/750V	TUV
Alt.	Various	60227 IEC 02(RV)	95mm^2, 70mm^2 4mm^2, 35mm^2, 25mm^2 ,450/750V	TUV
Fuse	BUSSMANN	170M5412	630A/690V	VDE & UL
Fuse	LITTEL FUSE	KLK D30	30A/600V	UL E81895
Relay	TYCO Electronics	T92S7D12-12	277VAC/30A	VDE 40019600
DC fan	PELKO MOTORS INC	R9238M12B PCB1-7	12V/0.819A	VDE & UL
IGBT	Infineon	IKW40N120H3	1200V/40A	CE
IGBT	IR	IRG4PF50WPBF	900V/28A	CE
Thyristor	IXYS	CLA50E1200HB	1200V/50A	CE
Thyristor	SEMIKRON	SK100KQ12	1200V/101A	CE
Fast Recovery Diode	IR	RHRG75120	1200V/75A	CE
X -cap.	Shenzhen Su Rong Capacitors	MPX	280V 474 K(±10%)	VDE 40008924
X -cap.	Shenzhen Su Rong Capacitors	MPX	280V 0.1uF	VDE 40008924
X -cap.	Shenzhen Su Rong Capacitors	MPX	280VAC/3.3uF	VDE 40008924
X -cap.	Tenta Electric Industrial Co. Ltd.	MEX	275V,2.2uF	VDE 119119
Y -cap.	Murata Mfg. Co., Ltd.	KX	250V,470pF	VDE 4002831
Y -cap.	Yinan Don's Electronic Component Co., Ltd.	MKP	250V,103K	VDE 135256
PCB	Various	Various	130℃, 94V-0	UL
Inductor	Shenzhen Yuyuan Power Co. Ltd.	PFC Chock, PPI226040	800uH± 10%,20HKz	Test with the appliance
Inductor	BO LUO DA XIN ELECTRIC CO LTD	PFC Chock, PPI226040	800uH± 10%,20HKz	Test with the appliance

Object/Part No.	Manufacturer /Trademark	Type/Model	Technical Data2)	Mark(s) of Conformity1)
Wire	TAI-I ELECTRIC WIRE & CABLE CO LTD	EIW	180℃,94V-0	UL E85640
Varnish	HANG CHEUNG PETROCHEMICAL LTD	8562/C	130℃	UL E200154
PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-6150	130℃, 94V-0	UL E123995
Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD	PZ	130℃,94V-0	UL E165111
Epoxy	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD	3300A/B-1	130℃, V-0	UL E218090
Inductor	Shenzhen Yuyuan Power Co. Ltd.	INV Chock, PPF226026	620uH±10%, 30A	Test with the appliance
Inductor	BO LUO DA XIN ELECTRIC CO LTD	PFC Chock, PPI226040	800uH± 10%,20HKz	Test with the appliance
-Wire	TAI-I ELECTRIC WIRE & CABLE CO LTD	EIW	180℃,94V-0	UL E85640
-Spacer	KINGBOARD LAMINATES HOLDINGS LTD	FR-4	130℃, 94V-0	UL E123995
-Epoxy	WINNING HI-TECH CO LTD	WK-969A	90℃, V-0	UL E87252
-Varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a)	130℃	UL E228349
Transformer	JEPULS TECHNOLOGY (SHENZHEN) CO., LTD	EA66II IGBT DRV	1KHz	Test with the appliance
Transformer	BO LUO DA XIN ELECTRIC CO LTD	EA66II SCR DRV	1KHz	Test with the appliance
Transformer	BO LUO DA XIN ELECTRIC CO LTD	EE33	100W, 1.0mH	Test with the appliance
-Bobbin	CHANG CHUN PLASTICS	Phenolic T375J	94V-0	UL E59481
-Core	KAIYUAN	EPC13 KP4	--	--
-Wire	TAI-I ELECTRIC WIRE & CABLE CO LTD	MW75	130℃,94V-0	UL E85640
-Alt.	CHENG WEI INDUSTYR CO LTD	2UEW	130℃,94V-0	UL E227475
-Alt.	FENG CHING METAL CORP.	2UEW	130℃,94V-0	UL E172395
-Alt.	PACIFIC ELECTRIC WIRE & CABLE CO.,LTD	UEW	130℃,94V-0	UL E201757
-Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD	CT-280	130℃	UL E165111
-Alt.	XINYU SHENGDAFENG ELECTRIC MATERIAL CO., LTD	SDF-3 12	130℃,94V-0	UL E317896
-Varnish	HANG CHEUNG PETROCHEMICAL LTD	8562/C 8562E	130℃	UL E200154
-Alt.	YUEYANG GREEN TECHNOLOGY CO., LTD	JX1150Y 8-1N	130℃	UL E303754

Object/Part No.	Manufacturer /Trademark	Type/Model	Technical Data2)	Mark(s) of Conformity1)
-Teflon Tube	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CB-TT	200℃	UL E180908
-Alt.	GREAT HOLDING INDUSTRIAL CO., LTD	CB-TT-L	200℃	UL E156256
-Margin tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	WF	130℃,94V-0	UL E165111
-Alt.	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	#1350F	130℃,94V-0	UL E17385
-Alt.	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	#1350F	130℃, 94V-0	UL E17385

4.6	**TABLE: input current test**						**P**
EUT	Fuse#	Rated(A)	U(V)	P(Kw)	I(A)	I fuse(A)	Condition/status
By AC mains supply							
EA66400	Input breaker	545	342Vac	171.68	502	502	Normal operation at rated load
EA66400	Input breaker	545	380Vac	171.76	452	452	Normal operation at rated load
EA66400	Input breaker	545	402.8Vac	171.59	426	426	Normal operation at rated load
Note(s): measure the input currents with full load. (Loaded with empty battery charging and rated output full load)							

5.3 2.6.3.4/RD	**TABLE: Provisions for protective earthing**		**P**
EUT	Location	Resistance measured(mΩ)	comments
EA66400	I/P earth →O/P earth	0.018	Tested at 250A/10munites
	I/P earth →metal enclosure	0.026	Tested at 250A/10munites
	I/P earth →earth on PCB	0.026	Tested at 250A/10munites

7.7	**TABLE: maximum temperatures**				**P**
	Test voltage (V) ……:	See below			—
	t1(℃) ……..……..:	--			—
	t_2(℃) ……..……..:	--			—
Maximum temperature T of part/at:	T (℃) 342V/ 50Hz		T (℃) 402.8V/ 50Hz		Allowed T_{max}(℃)
	-	-	-	-	
Connector	39.2	54.0	38.6	53.5	95
Input wire	38.5	53.3	36.7	51.6	105
Output wire	36.8	51.6	36.3	51.2	105
DC battery connector	32.3	47.1	32.5	47.4	95
DC wire	34.8	49.6	34.8	49.7	105

PCB near fuse	32.6	47.4	32.6	47.5	130
RY1 body	38.2	53.0	39.3	54.2	130
RY4 body	40.4	55.2	42.2	57.1	130
T1 coil	63.1	77.9	64.5	79.4	130-10=120
C10 body	36.2	51.0	36.6	51.5	105
PCB near Q1 body	58.8	73.6	58.5	73.4	130
RY2 near panel	33.3	48.1	34.3	49.2	130
DC fan body	38.2	53.0	38.8	53.7	85
U3 body	33.6	48.4	33.6	48.5	130
Transformer coil（near RS232）	46.8	61.6	43.7	58.6	130-10=120
Panel	29.1	43.9	29.7	44.6	85
Enclosure of Main module	30.3	45.1	29.9	44.8	60
Ambient	25.2	40.0	25.1	40.0	--
Note(s): 1. The temperatures were measured under worst normal mode defined in 1.2.2.1 and as described in 1.2.2.1 and as described in sub-clause 1.6.2 and at voltages as described above. 2. The maximum ambient temperature permitted by the manufacturer's specification is 40℃					

8.1	**TABLE: earth leakage current**				**P**
EUT	Condition	L→PE (mA)	N→PE (mA)	Limit (mA)	
EA66400	Line mode	2.93	2.92	3.5	Swith on
	RS232 to L/N	0.001	0.001	0.25	Swith on
	RS485 to L/N	0.001	0.001	0.25	Swith on
	USB	0.002	0.002	0.25	Swith on

5.3,7 and 8.2	**TABLE:electric strength tests,impulse tests and voltage surg**	**P**
Test voltage applied between:	Test voltage(V)	Breakdown Yes/No
Primary to SELV(RS-232)	3000Vac	No
Primary to SELV(RS485)	3000Vac	No
Primary to SELV(USB)	3000Vac	No
Input L/N to front Panel	1500Vac	No
Input L/N to earth	1500Vac	No
Output L/N to earth	1500Vac	No
T1 (Pri-Sec) (main board)	3000Vac	No

7.5 and 8.3	TABLE:fault condition tests					P
	Ambient temperature (℃)		25℃			--------
	Model/type of power supply		See nameplate for details			--------
	Manufacturer of power supply		See nameplate for details			--------
	Rated markings of power supply		See nameplate for details			--------
Component No.	Fault	Test voltag (V)	Test time	Fuse No.	Fuse curre (A)	Result
DC Fan	Block	402.8	2hours	--	--	Max. temperature: (main board) TX1 coil: 76.3 ℃ TX1 coil: 70.3℃ PCB near Q1 body:84.0℃ Ambient: 25.0℃ Recoverble, no hazard.
Ventilation	Block	402.8	1hours	--	--	Max. temperature: (main board)TX1 coil: 76.5℃,TX1 coil : 72.3℃ PCB near Q1 body:106.4℃ Ambient: 24.5℃ After 30nins, display: 41.no output voltage.
DC Fan	Block	DC 240V (by batteries)	2hours	--	--	Max. temperature: (main board) TX1 coil: 86.5 ℃ TX1 coil: 80.4℃ PCB near Q1 body:83.0℃ Ambient: 25.0℃ Recoverble, no hazard.
Ventilation	Block	DC 240V(by batteries)	1hours	--	--	Max. temperature: (main board)TX1 coil: 86.5 ℃,TX1 coil : 82.5℃ PCB near Q1 body:105.3℃ Ambient: 25.1℃ After 30nins, display: 41.no output voltage.
T01 Pin 1-2(main board）	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
T01 Pin 6-7(main board）	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
T1 (near RS232)	s-c	380	4mins	--	--	Unit working abnormal,, no hazard.
Other transformer	s-c	380	5mins	--	--	Unit shutdown immediately or

						abnormal,No damaged, no hazards
C1	s-c	380	4mins	--	--	Unit working abnormal, non-recoverable.
U1 Pin1-2	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
U1 Pin3-4	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
U2 Pin1-2	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
U2 Pin3-4	s-c	380	4mins	--	--	Unit working abnormal, no hazard.
Q1 1-2	s-c	380	4mins	--	--	Unit working abnormal, non-recoverable, no hazard
Note(s): s-c means short-circuit.o-l means overload.o-c means open-circuit.						

Appendix 1

Whole views of 'Online High Frequency UPS'
Model: EA66400

Appendix 2

Whole views of 'Online High Frequency UPS'
Model: EA66400

Appendix 3

Whole views of 'Online High Frequency UPS'
Model: EA66400

Appendix 4

Whole views of 'Online High Frequency UPS'
Model: EA66400

Appendix 5

Internal view of 'Online High Frequency UPS'
Model: EA66400

Appendix 6

Internal view of 'Online High Frequency UPS'
Model: EA66400

Appendix 7

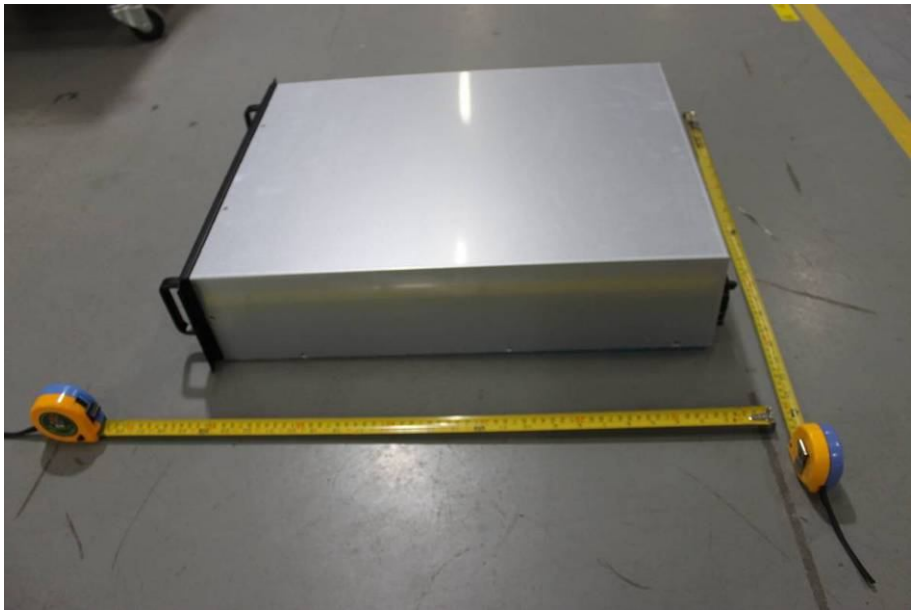
Internal view of 'Online High Frequency UPS'
Model: EA66400

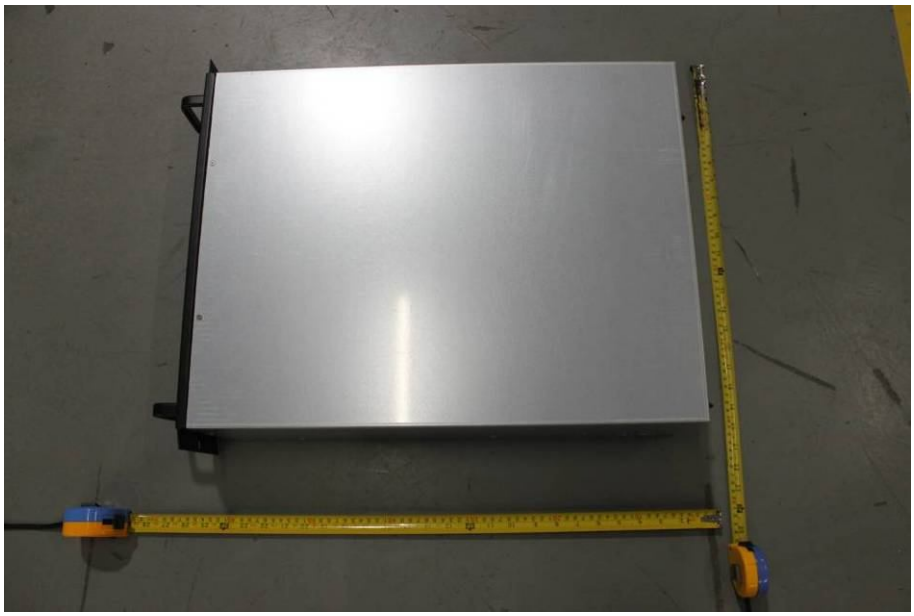
Appendix 8

Internal view of 'Online High Frequency UPS'
Model: EA66400

Appendix 9

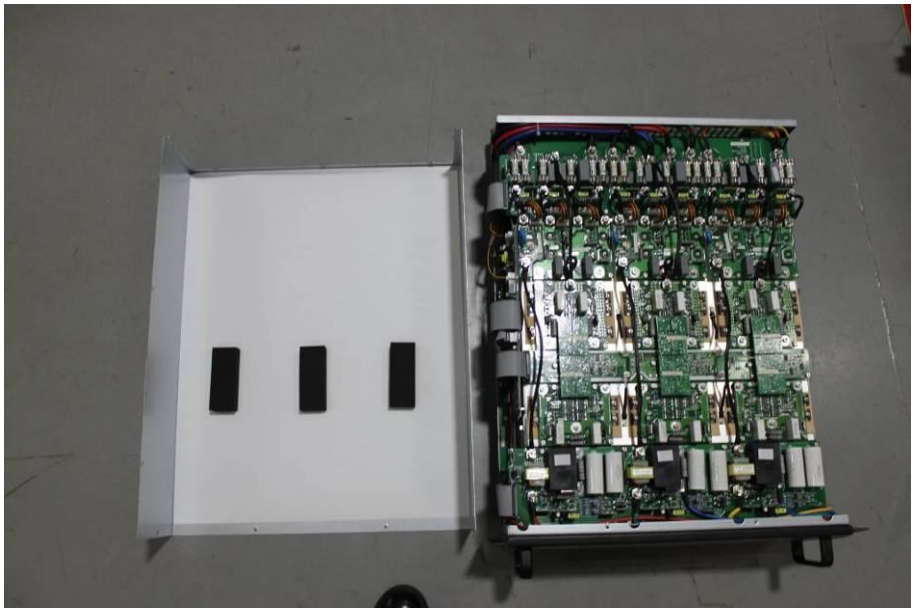
Main module views of 'Online High Frequency UPS'
Model: EA66400





Appendix 10

Main module inner views of 'Online High Frequency UPS'
Model: EA66400



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